

# Cambridge International AS & A Level

COMPUTER SCIENCE 9618/23

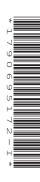
Paper 2 Fundamental Problem-solving and Programming Skills

October/November 2023

INSERT 2 hours

## **INFORMATION**

- This insert contains all the resources referred to in the questions.
- You may annotate this insert and use the blank spaces for planning. **Do not write your answers** on the insert.



An error will be generated if a function call is not properly formed or if the parameters are of an incorrect type or an incorrect value.

## String and character functions

- A string of length 1 may be considered to be either of type CHAR or STRING
- A CHAR may be assigned to, or concatenated with, a STRING
- A STRING of length greater than 1 cannot be assigned to a CHAR

```
LEFT (ThisString : STRING, x : INTEGER) RETURNS STRING

returns leftmost x characters from ThisString
Example: LEFT ("ABCDEFGH", 3) returns "ABC"
```

```
RIGHT (ThisString : STRING, x : INTEGER) RETURNS STRING

returns rightmost x characters from ThisString
Example: RIGHT ("ABCDEFGH", 3) returns "FGH"
```

```
MID(ThisString : STRING, x : INTEGER, y : INTEGER) RETURNS STRING

returns a string of length y starting at position x from ThisString

Example: MID("ABCDEFGH", 2, 3) returns "BCD"
```

```
LENGTH (ThisString: STRING) RETURNS INTEGER

returns the integer value representing the length of ThisString
Example: LENGTH ("Happy Days") returns 10
```

```
TO_UPPER(x : <datatype>) RETURNS <datatype> <datatype> may be CHAR or STRING
```

returns an object of type <datatype> formed by converting all characters of x to upper case.

#### Examples:

- TO UPPER("Error 803") returns "ERROR 803"
- TO UPPER('a') returns 'A'

```
TO_LOWER(x : <datatype>) RETURNS <datatype>
<datatype> may be CHAR or STRING
```

returns an object of type <datatype> formed by converting all characters of x to lower case.

#### Examples:

- TO LOWER ("JIM 803") returns "jim 803"
- TO LOWER ('W') returns 'w'

```
NUM_TO_STR(x : <datatype1>) RETURNS <datatype2>
returns a string representation of a numeric value.
<datatype1> may be REAL or INTEGER, <datatype2> may be CHAR or STRING
Example: NUM_TO_STR(87.5) returns "87.5"
If x is a negative value, the returned value will be a string beginning with the '-' character.
```

```
STR_TO_NUM(x : <datatype1>) RETURNS <datatype2>
returns a numeric representation of a string.
<datatype1> may be CHAR or STRING, <datatype2> may be REAL or INTEGER
Example: STR_TO_NUM("23.45") returns 23.45
```

IS NUM(ThisString : <datatype>) RETURNS BOOLEAN

returns TRUE if ThisString represents a valid numeric value.

<datatype> may be CHAR or STRING

Example: IS NUM("-12.36") returns TRUE

ASC (ThisChar: CHAR) RETURNS INTEGER

returns an integer value (the ASCII value) of ThisChar

Example: ASC ('A') returns 65, ASC ('B') returns 66, etc.

CHR(x: INTEGER) RETURNS CHAR

returns the character whose integer value (the ASCII value) is  $\times$  Example: CHR (65) returns 'A', CHR (66) returns 'B', etc.

#### **Numeric functions**

INT (x : REAL) RETURNS INTEGER

returns the integer part of x

**Example:** INT (27.5415) returns 27

RAND(x : INTEGER) RETURNS REAL

returns a real number in the range 0 to x (**not** inclusive of x).

Example: RAND (87) could return 35.430729

## **Date functions**

Date format is assumed to be DD/MM/YYYY unless otherwise stated

DAY (ThisDate : DATE) RETURNS INTEGER

returns the current day number from ThisDate

Example: DAY (04/10/2003) returns 4

MONTH (ThisDate : DATE) RETURNS INTEGER

returns the current month number from ThisDate

Example: MONTH (04/10/2003) returns 10

YEAR (ThisDate : DATE) RETURNS INTEGER

returns the current year number from ThisDate

**Example:** YEAR (04/10/2003) returns 2003

DAYINDEX (ThisDate : DATE) RETURNS INTEGER

returns the day index number from ThisDate where Sunday = 1, Monday = 2 etc.

Example: DAYINDEX (07/11/2023) returns 3

SETDATE (Day, Month, Year: INTEGER) RETURNS DATE

returns a value of type DATE with the value of <Day>/<Month>/<Year>

Example: SETDATE (26, 10, 2003) returns a date corresponding to 26/10/2003

TODAY() RETURNS DATE

returns a value of type DATE corresponding to the current date.

## **Text file functions**

EOF (FileName: STRING) RETURNS BOOLEAN

returns TRUE if there are no more lines to be read from file FileName
The function will generate an error if the file is not already open in READ mode.

# **Operators**

An error will be generated if an operator is used with a value(s) of an incorrect type.

&	concatenates (joins) two strings.  Example: "Summer" & " " & "Pudding" evaluates to "Summer Pudding" may also be used to concatenate a CHAR with a STRING
AND	performs a logical AND on two Boolean values.  Example: TRUE AND FALSE evaluates to FALSE
<b>O</b> R	performs a logical OR on two Boolean values.  Example: TRUE OR FALSE evaluates to TRUE
NOT	performs a logical NOT on a Boolean value.  Example: NOT TRUE evaluates to FALSE
MOD	finds the remainder when one number is divided by another.  Example: 10 MOD 3 evaluates to 1
DIV	finds the quotient when one number is divided by another.  Example 10 DIV 3 evaluates to 3

# Comparison operators

	used to compare two items of the same type. evaluates to TRUE if the condition is true, otherwise evaluates to FALSE
=	Notes:
>	
	may be used to compare types REAL and INTEGER
<	may be used to compare types CHAR and STRING
	case sensitive when used to compare types CHAR and / or STRING
>=	cannot be used to compare two records
<=	Examples:
<>	"Program" = "program" evaluates to FALSE
	• Count = 4 evaluates to TRUE when Count contains the value 4

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